Severe, Asymptomatic Hypertension in the ED

How many times a day do we see an elevated blood pressure recorded on a patient's chart? When should you treat it, and when should you refer the patient for follow-up? Should a patient be started on antihypertensive medications or a new one added to the regimen? Based on the latest literature, the speaker will discuss the spectrum of hypertensive disease, particularly asymptomatic hypertension, and its ED evaluation and treatment.

- Define severe, asymptomatic hypertension.
- Describe the indications for diagnostic testing in patients with hypertension.
- Discuss the latest recommendations, guidelines, and clinical policies pertaining to patients with severe hypertension

TH– 325
10/30/2014/ 10:00 AM– 10:50 AM
Skyline Ballroom, W375a– McCormick Place

(+) No significant financial relationships to disclose

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Severe, Asymptomatic Hypertension in the ED—Don’t Just Do Something, Stand There

10/30/2014
Trevor Lewis, MD

“BP 205/100...MD Aware”
CASE #1

- 45 year old sent to the ED because her blood pressure was high per her PMD at Walgreens. Patient has no complaints
- Vitals BP 180/110 P 64 RR 16
- PE: Normal
- What do you want to do???

Case # 2

- 50 year old male. Told he’s had hypertension in past. Not on medications. Here for left ankle pain after fall
- Vitals BP 200/120
- PMH: TIA; HTN
- PE: Right ankle with swelling at lateral malleolus; otherwise normal exam
- What to do??
Case #3

- 52 year old female presenting with headache. Thinks its because her blood pressure is high. Headache came on acutely this am; no history of similar headache in past. Not relieved by Motrin or Tylenol
- Vitals BP 180/110 P 52 RR 16
- PMH: None
- PE: HEENT No neck stiffness; positive photophobia
- What to do??

Uncontrolled high blood pressure for adults with hypertension

NOTE: Uncontrolled high blood pressure is a measured systolic blood pressure of at least 140 mm Hg or a measured diastolic blood pressure of at least 90 mm Hg among those with measured high blood pressure or who reported taking antihypertensive medication.

SOURCE: CDC/NCHS, Health, United States, 2012, Figure 9. Data from the National Health and Nutrition Examination Survey.
How common in ED setting

- In 2006 16.2% of patients treated in ED’s across US had initial BP that was “severely high”
- BP greater than 160/100
- Approximately 15 million patients

Definitions

- Prehypertension 120-139/80-89
- Stage 1 Hypertension 140-159/90-99
- Stage 2 Hypertension >160/>100
- Severe Asymptomatic Hypertension >180/>100
Severe Asymptomatic Hypertension
- Greater than 180/100
- Defined as elevated blood pressure without signs of end organ damage
- Hypertensive Urgency
  - Patients with elevated blood pressure >180/100
  - No evidence end organ damage
  - PMH that includes CHF; CAD; Renal Insufficiency; Stroke/TIA

Hypertensive Emergency
- BP elevated greater than 180/100
- Rapid decompensation of vital organ system caused by dysfunction of cardiac, renal or neurologic system secondary to elevated blood pressure
- Etiology's include:
  - Pulmonary edema
  - Aortic dissection
  - Pre-eclampsia
  - Subarachnoid hemorrhage
  - Hypertensive encephalopathy
  - Acute kidney injury
What about headache?

- Not considered a marker of hypertensive emergency
- Usually the headache caused the high blood pressure
- Similar mechanism for epistaxis

Is screening appropriate for target organ injury?

  - 109 asymptomatic patients with BP greater than 180/100
  - All patient had BMP, UA, CBC, Chest X-ray, EKG
  - Results; 7 patient had clinically meaningful results
  - No test actually was related to marker of acute injury
Urinalysis

- Looking for proteinuria and hematuria
- Negative UA strong prognosticator of normal kidney function
- No good evidence exists for use as screening tool

BMP

- Able to screen for creatinine and GFR
  - 167 patients with DBP greater than 100
  - 10 patients admitted for new onset or worsening renal function
  - Is the elevation acute or chronic??
EKG

- EKG findings usually in chronic hypertension
- LVH will occur secondary to cardiac remodeling in prolonged hypertension
- Patients with hypertension have an increased risk of atrial fibrillation
- Patients with EKG criteria for LVH face increased risk of CAD, Heart failure, Arrhythmias, sudden death

Chest X-Ray

- Screening for pulmonary edema or aortic dissection?
  - Chest x-ray and EKG on 109 patients enrolled in hypertension clinic
  - Chest x-ray changed management in 2 patients for an unrelated pulmonary diagnosis
- Not a good screening tool for aortic dissection (Chest x-ray can be normal 85% of time)
ACEP Clinical Policy Asymptomatic HTN, 2013

- **Level C recommendations.**
- (1) In ED patients with asymptomatic markedly elevated blood pressure, routine screening for acute target organ injury (eg, serum creatinine, urinalysis, ECG) is not required.
- (2) In select patient populations (eg, poor follow-up), screening for an elevated serum creatinine level may identify kidney injury that affects disposition (eg, hospital admission).

Caveats

- In select populations with poor follow-up screening for an elevated serum creatinine level may identify kidney injury that affects disposition.
- Suggestion of utility in African American population
- Clinical judgment and pretest probability should drive utility of testing
VBG

- VBG
- Creatinine
- GFR
- Potassium

Should you treat the blood pressure

- IV....
- PO....
- Watch the patient
Why not normalize blood pressure?

• May be harmful
  • Central Perfusion Pressure= Mean Arterial Pressure-Intracranial Pressure
  • CPP=MAP-ICP
  • Auto regulation is lost at higher pressures

Fig. 1: Auto regulation of cerebral blood flow in a normal brain and in the ischemic penumbra (the tissues surrounding the ischemic core after a stroke).

Semplicini A, and Calò L. CMAJ 2005;172:625-626
SL Nifedipine

- Multiple reports of serious outcomes including stroke, cerebral ischemia, hypotension, and death

**Should a Moratorium Be Placed on Sublingual Nifedipine Capsules Given for Hypertensive Emergencies and Pseudoemergencies?**

**VA Cooperative Trial 1967**
- 143 Males with Diastolic 115-130 mmHg
- Placebo versus antihypertensive
  - No adverse outcomes either group at 3 months
  - At 20 months
    - 27/70 treated with adverse effects
    - 2/73 with placebo had adverse effects
Does it make a difference?

- Hourly Clonidine to normal then discharge on PO
- Hourly loading with placebo then discharge on PO
- No load; discharge on PO
  - Results
  - No difference in 24 hours or one week
  - Adequate control at one week

Maybe it will just get better..

- Dieterle, et al. *Moderate to severe blood pressure elevation at ED entry. Hypertension or normotension.*
- Patients with entry BP greater than 160/110
- Measure BP Q 2 minutes for 2 hours
  - Results:
  - Best time to discriminate between hypertensive and normotensive was 60-90 minutes
  - 26/41 remained hypertensive
Maybe it will just get better..

- BP of greater than 140/90 discharged with home monitor
- Measured for one week at home
- 79/156 had elevated blood pressure

How about PO medications

- Do we give PO meds prior to discharge?
- What medications should we use?
- What about follow-up?
ACEP 2013 Guidelines

- **Level C recommendations.**
- (1) In patients with asymptomatic markedly elevated blood pressure, routine ED medical intervention is not required.
- (2) In select patient populations (e.g., poor follow-up), emergency physicians may treat markedly elevated blood pressure in the ED and/or initiate therapy for long-term control. [Consensus recommendation]
- (3) Patients with asymptomatic markedly elevated blood pressure should be referred for outpatient follow-up. [Consensus recommendation]
• There is little science and less consensus to help physicians decide which patients with elevated blood pressure without acute end-organ effects require initiation of oral anti-hypertensive prior to prompt follow-up. EMPGU, June 2012

• Initiate a maintenance dose of an oral medication before discharge in patients with SBP of 200mm HG or greater, or DBP or 120 mmHG or greater; this is optional for patient with lower blood pressure

Evaluation and Treatment of Severe Asymptomatic Hypertension
CHAD S. KESSLER, MD, and YAZEN JOUDEH, MD, University of Illinois at Chicago College of Medicine, Chicago, Illinois
So let's give it a try

- 549 patients with BP greater than 180/110
- 175/549 decreased within 30 minutes observation
- Remaining 374 treated with PO medications
- 78/374 didn’t respond to PO medications and were referred for “personalized treatment”
- No adverse events at 48-72 hour phone follow-up

Value Trial

- Valsartan versus Amlodipine in treating hypertension
- Most of adverse affects occurred in first 6 months when you had biggest difference in blood pressure between treatment group
- OVERALL: No value to immediate treatment but should obtain your goal within 6 months
What PO med to use

• In general nonblack population initial therapy should include one of the following:
  • Thiazide type diuretic
  • Calcium channel blocker (CCB)
  • Angiotensin-converting enzyme inhibitor (ACE)
  • Angiotensin receptor blockade (ARB)

• Each of the four drug classes yielded decrease in overall mortality; and cardiovascular, cerebrovascular, and kidney outcomes
• Thiazides yield best decrease in heart failure outcomes
What not to use

- B-Blockers
  - One study indicated higher rate of stroke
- Clonidine
  - Rebound blood pressure
- Hydralazine
  - Not predictable
- Nitrates
  - Not predictable

Many people need more than one drug; all 4 medications would be good “add-on”
- Thiazide for ED purpose would be HCTZ
- Always important to give adequate dose
- Recommendations for general population; not specific population (CAD; CHF; etc.)
- For African Americans
  - Thiazide type diuretic
  - Calcium channel blocker
- ACE inhibitors demonstrated higher rate of CVA's

- Chronic Kidney Disease (CKD)
  - ACE
  - ARB
- Recommendations based on showing superior kidney outcomes; no difference in cardiovascular outcomes
- Recommendation is for patients >18; < 75 yo
What is the “PMD” doing

- If goal not reached in one month; increase dose or add a second drug from “Class of 4”
- If goal not achieved with two; add a third
  - Don’t use ARB and ACE together
- If not controlled with three; use other drugs or refer to hypertension specialist

Hypertensive Emergency

- Elevated blood pressure with evidence of end organ damage
- Treatment:
  - Target maximal reduction of MAP at 25% within first hours; goal of 160/100 in 2-6 hours
Hypertensive Emergency

- Neurologic
  - Hypertensive Encephalopathy
  - Ischemic Stroke
  - Hemorrhagic Stroke
  - Subarachnoid hemorrhage
- Remember a headache is not a hypertensive emergency

Hypertensive Encephalopathy

- Rapid rise in blood pressure overwhelms auto regulatory mechanisms
- Increased vascular permeability; edema
- Diagnosis of exclusion (Negative CT head)
- Goal: Reduce MAP 20-25%
- Meds: Nicardipine, Labetolol, Esmolol (Avoid Nitroprusside)
Ischemic Stroke

- 70% patients stroke patients have hypertension
- Cerebral auto regulation
- Stand by unless:
  - BP greater than 185/110 in candidate for reperfusion
  - BP greater 220/120

Guidelines for treatment:
- SBP > 200mmHg; MAP > 150mmHg
- Maintain MAP below 130mmHg or SBP below 160 if normal ICP
- Maintain MAP below 140mmHg or SBP less than 160mmHg if elevated ICP.

Intracranial Hemorrhage

- Need a balance between worsening bleed and hypo perfusion
- Guidelines for treatment
  - SBP > 200mmHg; MAP > 150mmHg
  - Maintain MAP below 130mmHg or SBP below 160 if normal ICP
  - Maintain MAP below 110mmHg or SBP less than 160mmHg if elevated ICP.
Subarachnoid hemorrhage

- Rebleeding more common with SBP > 160mmHg
- When blood pressure is elevated, short-acting continuous-infusion intravenous agents with a reliable dose-response relationship and favorable safety profile are desirable. (Nicardipine)
  - Stroke. 2009; 40: 994-1025 Published online before print January 22, 2009, doi: 10.1161/STROKEAHA.108.191395

Acute Coronary Syndrome

- Treat if blood pressure is greater than 160/100; goal is 20-30% reduction
- Remember the spectrum of ACS (STEMI versus NSTEMI)
Pulmonary Edema/CHF

- Signs and symptoms of heart failure accompanied by elevated blood pressure and preserved LV function (HFrEF)

Goal is very large reductions in blood pressure which is the exception to the rule

- Target SBP is 100-120mmHG
  - Khan, eta al. Chest 2002

Aortic Dissection

- Goal is very large reductions in blood pressure which is the exception to the rule
- Target SBP is 100-120mmHG
  - Khan, eta al. Chest 2002
Acute Renal Failure

- No good guidelines on treatment
- Goal would be to decrease pressure on the renal parenchyma
- Usually chronic hypertension causing renal damage

Case #1

- Patient had repeat blood pressure of 160/90 after 30 minutes in ED
- No complaints; has good follow-up with PMD
- Disposition:
  - No labs; no discharge medications
  - Will follow-up in the next week
Case #2

- Patient has repeat BP of 190/120
- Had VBG drawn 7.32/K+ 4.2/Creatinine 0.8/GFR>60
- Has no PMD for follow-up
- Disposition
  - Given Nifedipine 30 XL in ED
  - No blood pressure recheck
  - Given MD on call and told to follow-up in the next week

Case #3

- Patient had imaging of head due to severity of headache (Not HTN)
- Repeat BP 190/110
- Disposition:
  - Admit NICU
  - IV Nicardipine targeting SBP of 160mmHg
  - PO Nimodipine (For vasospasm; not HTN)
Understand the spectrum

- Asymptomatic Hypertension
- Hypertensive Urgency
- Hypertensive Emergency

Questions?